

MARINE REVIEW.

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No. 5.

A New Ferry Steamer.

The ferry business between Detroit and Windsor is the most extensive of the kind on the lakes. When passenger and car ferries on the river at this point are plying back and forth, and the big steel steamers and the steam-barges with tows are passing up and down the river, it does n't require a great stretch of imagination to compare the sight to the busy scene on East River, New York. With this issue the REVIEW presents an illustration of the Promise, the latest addition to this ferry fleet.

The ferry Promise was steamer No. 108, built by the Detroit Dry Dock Company, for the Detroit, Belle Isle and Windsor Ferry Company. It is a wooden steamer, 130 feet long, 118 feet on the water line, 38 feet beam, 34½ feet beam on the water line, and 50 feet over guards; moulded depth 13 feet 7½ inches, and draft about 11 feet. The hull was constructed at the Clark dry dock, and the joiner work, cabins, etc. at the Orleans street yard of the dry dock company. The cabins are finished very handsomely, the men's cabin in oak, and the women's in mahogany, with toilet rooms for each, marble washstands, etc. of the very latest pattern. On the promenade deck is built a cabin finished in oak. It affords protection from the wind and weather, as well as protecting the stairs. The machinery, built by the Dry Dock Engine Works, consists of a three-cylinder, non-condensing engine, which can be used with the high steam in all three cylinders, or compounded by using high pressure in one cylinder and exhausting in the other two. There are two boilers, 9½ feet in diameter and 12½ feet long, with a working pressure of 125 pounds. A complete electric plant of 125 lights supplying the illumination, was installed by the Detroit Electrical Works, Detroit. The steamer has a capacity of 1,200 passengers, and that number can be very comfortably accommodated. Kitchen, dining room, etc. are situated under the main deck aft, and sleeping berths for the firemen are forward. Boats of this style would do excellent work in transporting passengers from Chicago to Jackson Park during the world's fair.

Lake Freight Matters.

The fact that iron ore shipments to August 1 are known to be close to the four million mark, or only 300,000 or 400,000 tons less than they were on the corresponding date in 1890 when a little more than 9,000,000 tons of ore was shipped from the Lake Superior district, has caused some dealers to look for a restriction in the movement for the latter half of the season, but like all other predictions in iron matters of late this opinion can be said to have little more foundation than hopes of opposite interests for early improvement in the demand for ore. It is true that large shipments of unsold ore have been made and that a few mines, notably the Champion, have quit work altogether, but it is also true that the mines producing desirable grades of ore, that were sold up almost to the limit of production during the winter, are only meeting the requirements of these sales in shipments already made, and any sign of the long-delayed improvement in iron would warrant a continuance of the present active movement in ore. The shipments are, of course, a little more than 1,000,000 tons ahead of last year, but this is more than discounted by the delay of nearly two months in beginning the ore shipping season of 1891. With the shutting down of iron mills in different sections of the country stocks of manufactured iron and steel have been reduced so that dealers find great difficulty in supplying the demand. A renewal of operations in this line must help a reduction in pig iron

stocks but the extent of assistance on this account would again be only a guess regarding the market.

With the exception of scarcity of coal cargoes for the head of Lake Superior, vessels are all finding employment at rates that show some improvements over the opening figures, and that are altogether fairly profitable. The ore freight market has settled at 75 cents from Escanaba, \$1 from Marquette and \$1.15 from Ashland and Two Harbors to Ohio ports. Stocks of corn in Chicago show a marked increase and it would be moving more freely but for some fear as to its quality. Duluth grain shippers have asked vessel owners for bids on large quantities of wheat to be moved during the fall months, but the losses suffered by vessels for which such contracts were made last fall have caused a wide difference in the opinions of owners and shippers as to the rates that should be paid on the grain, and no contracts have been made as yet.

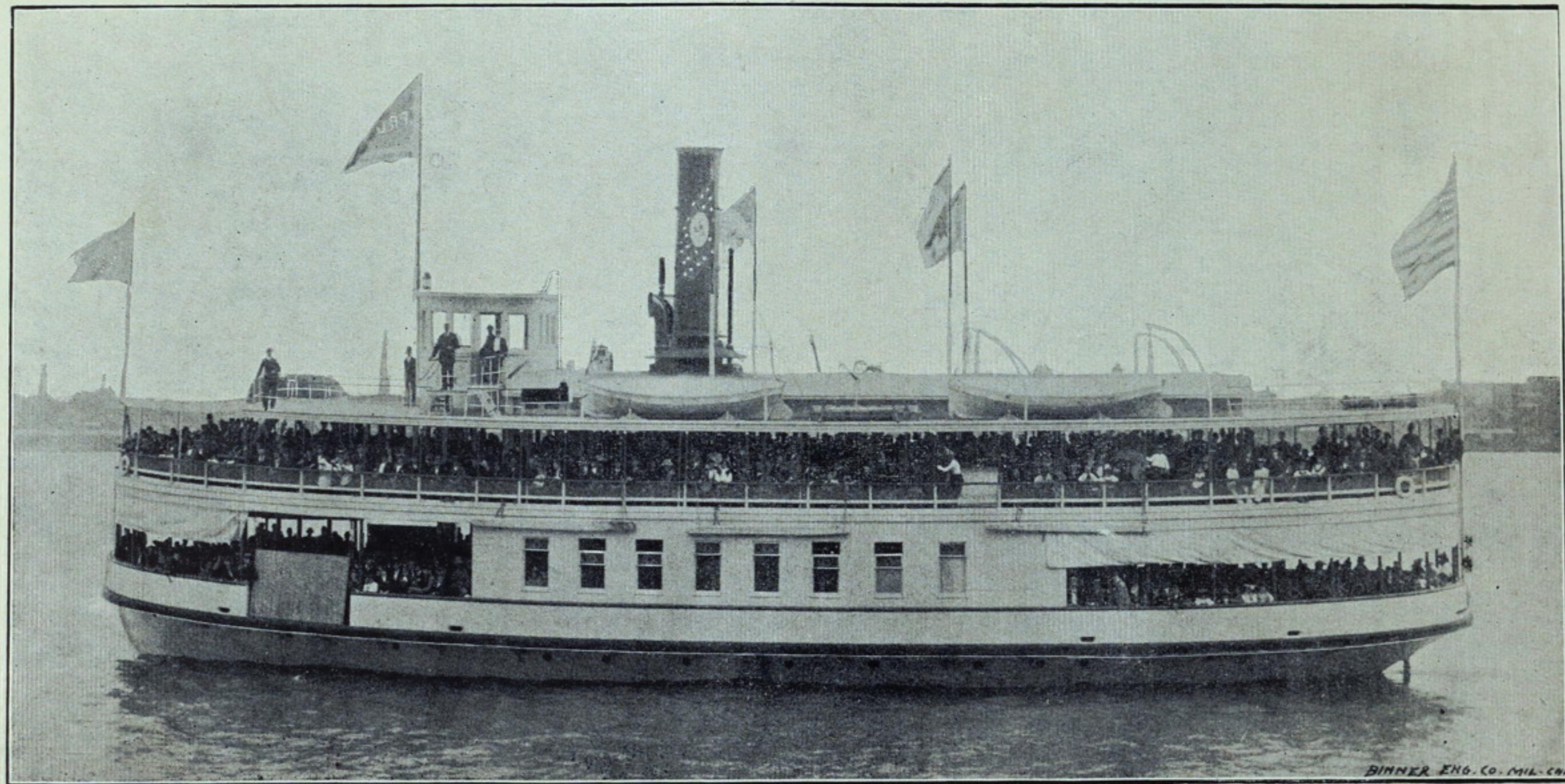
More than 30,000 Net Registered Tons.

Here is an indication of the manner in which lake shipbuilders are surpassing the builders of the coast in turning out merchant vessels of steel and iron: The United States Standard Steamship Owners' Builders' and Underwriters' Association of New York publishes a register of iron and steel vessels for insurance purposes. A supplement of this register just issued gives a rating, valuation, etc. to steel vessels launched on the lakes during the years 1891 and 1892. Although all steel vessels built on the lakes during these years are not recorded by the association, the supplement contains a list of twenty-one such vessels on the lakes as against sixteen on the entire American coast. The twenty-one lake vessels have a combined net registered tonnage of 30,613, and are as follows: Andaste, Cadillac, Choctaw, Codorus, Comanche, James B. Colgate, W. H. Gilbert, John B. Ketchum, Mahoning, Mariposa, Maritana, Pathfinder, Pillsbury, Pioneer, Sagamore, Samuel Mather, Samuel Mitchell, Schuylkill, Thomas Wilson, Virginia and Washburn.

Detroit River Lights.

One of the items in the light-house appropriations carried by the civil sundry appropriation bill provides \$8,600 for the construction or purchase, equipment and maintenance of three small light vessels for use in the Detroit river. The bill says nothing about where these vessels are to be located and the item seems to be a strange one, as in all previous measures pertaining to lake lights the only light-ship provided for in the Detroit river, outside of the Lime-Kilns floats and the Bar point light-vessel, was the light at Ballard's. It is a consolation, however, that as regards the Detroit river the bill provides for even more than was asked, and if the rulings of the treasury department will permit of it this appropriation can undoubtedly be used to advantage.

Some of the stockholders of the Detroit Dry Dock Company favor the removal of their steel shipbuilding plant from Wyandotte to Detroit, where the company recently completed one of the finest dry docks on the lakes. Repairs to steel vessels already involve a large expenditure of money annually and this work will increase largely in the future. The Detroit company owns a large tract of land adjacent to the new dock, offices and engine works where wooden vessels have been built in the past, and for various reasons the proposed change would seem advantageous.



Built by the DETROIT DRY DOCK COMPANY.

Supplement to MARINE REVIEW, Cleveland, O.

PASSENGER FERRY STEAMER PROMISE.

CHICAGO LAKE INTERESTS.

WESTERN OFFICE, MARINE REVIEW,
No. 13 Western Union Building, CHICAGO, ILL., Aug. 4.

Within ten days work on the abutment of South Halsted street bridge will have been commenced, and then the marine interests can whistle. If the bridge is really going to be such an obstruction as vesselmen have claimed, it would seem to be worth the while to take steps to stop its construction. Vessel men have asserted that it will result in endless jams and expensive waits, that it is nothing but an unreasonable obstruction, and that the secretary of war ought to stop its construction. If it were really so serious a matter, it would seem that marine men would be in earnest in making a fight. As a matter of fact, the opposition so far has been confined to a meeting of the Lake Line Agents' Association, where resolutions were passed that the secretary of war ought to take full charge of Chicago river. A communication to that effect was sent to Secretary Elkins and to the treasury department. There the matter has dropped. It is true that several vessel men have called upon the commissioner of public works protesting against the bridge, but the commissioner is also a candidate for congress from the district most vitally effected by the proposed bridge, and he knows where the votes are. Consequently he has taken the very action now that a year ago he condemned so severely when taken by the Cregier administration. He is building the bridge before any steps have been taken to condemn land for the widening of the river. If marine men can hold together long enough to make an effective fight, an injunction ought to be secured at once against the erection of a bridge until the secretary of war has consented to the plans. A Chicago judge threw out condemnation proceedings at Fourteenth street some time ago because the city had no right to go on with the construction of a bridge before the war department had passed upon the plans. If that was good law at Fourteenth street, it is good at South Halsted street. But to get out injunctions costs money, and who is going to pay the lawyers' bill? It would seem to be a very proper thing for the Lake Carriers' Association to do so. It comprises in its membership many Chicago vessel owners. The question is more important at the present time than the proposed bridge at Duluth. The vessels of perhaps a majority of the members of the association will, during the season, suffer serious delay at this point. The Lake Carriers Association has the money to hire lawyers, and the burden is equally divided among all those who receive the benefit of a successful contest. Whether the lake carriers take hold or not, it is quite certain that Chicago marine men will not go down in their pockets to defray the expenses of lawsuits, in which the whole lake marine is nearly as much interested as themselves. This probably means that the bridge will be built, and marine men will kick. After the bridge is in place kicking will amount to very little.

Reports have it that plans for a big dry-dock on the Calumet have been about completed. It will be under the management of the Chicago Ship Yard Company.

The old whaler Progress is now at anchor off the Lake Front park. The man-of-war Michigan is anchored not far away. The two boats are about the same age, and look equally seedy compared with the modern lake vessels which pass them. As the investment on the Progress has not been heavy, it is likely that the syndicate will get its money back from the venture.

At the Canadian Capital.

Special Correspondence to the MARINE REVIEW.

OTTAWA, ONT., Aug. 4.—Your Kingston correspondent is spending a vacation in this city, the capital of the Dominion. The announcement that President Harrison had approved of the Curtis retaliation bill caused considerable excitement here and the railways and canals department was besieged by newspaper men who desired to ascertain what steps the Government intended to take in the matter. Nearly all the ministers are absent, and those remaining are very cautious in making statements. The Hon. M. Bowell stated that while Canada possessed the means of next to destroying United States marine on the lakes, the government would do nothing without most mature deliberation. He hardly expected the president to make use of the power vested in him and therefore it would be premature to make a move in any direction. The general opinion in the capital is that Canada will propose arbitration as soon as possible. If such proposition is not accepted the best of the situation will have to be made. It now transpires that the new Canadian canal at Sault Ste. Marie will not be ready till the spring of 1896, which would compel the payment of tolls for four years to come, and seriously injure Canadian traffic.

The insurance on the burned steamer Glengarry, owned by the Montreal Transit Co. has not been disposed of as yet. The boat is of no further use to the company, which fact places a heavier responsibility on the underwriters than they care to bear.

Immense quantities of lumber are being sawn in this district, and purchased at increased prices as soon as being placed on the market. The buyers are middlemen, who claim that there will soon be a big demand for lumber in foreign markets, particularly in the United States. They are buying in anticipation of this demand.

A movement is on foot to enlarge Toronto harbor by opening Asbridge's

bay into it. A deputation was in Ottawa for two days urging the government to approve of the scheme.

The Hon. Charles Tupper, minister of marine, who was in England for some months has sailed for home. The canal tolls matter hurried his departure.

Favorable to the District Officers.

Special Correspondence to the MARINE REVIEW.

WASHINGTON, D. C., Aug. 4.—A sudden change has taken place in the status of the St. Mary's river lighting matter. The following orders were telegraphed from the light-house board to the Eleventh light-house district officers: "Col. Ludlow has appeared before an executive committee of the board. Orders heretofore given which prohibit a conformity to his latest project for lighting St. Mary's river are suspended. You are authorized in your discretion to limit thirty-eight lights of those proposed by him. Further orders will be given when a full meeting of the board can be held."

It is understood here that as soon as a full meeting of the board can be held the restoration of the late district officers will be asked as an act of justice to them.

Features of Col. Ludlow's Report.

Special Correspondence to the MARINE REVIEW.

WASHINGTON D. C., August 4.—The Government engineers on the lakes, have transmitted their annual reports to the chief of engineers in the war department. The reports of Col. Ludlow and Gen. Poe, are especially voluminous, each containing about 200 pages of closely type-written matter. These reports embody the estimates for next year's operations, together with many details concerning the progress of the different works on the lakes. Both the reports of Gen. Poe and Col. Ludlow, contain numerous recommendations regarding surveys in different channels where obstructions have been found, or referring to work of this kind already performed under their directions.

Col. Ludlow states that investigations made in Petoskey harbor show clearly that a harbor of refuge for the benefit of general commerce is not needed at that point, but that some protection from the weight of the winds from the northwest quadrant, to which the frontage is exposed, is decidedly in the interest of the considerable freight and passenger traffic of the locality. Concerning Frankfort harbor, Michigan, he says that it is evident that the piers should be built out to at least 15 feet curve, but the pier development provided for by the present project, namely 300 feet on the north pier, and 100 feet on the south pier, falls 500 feet short of this on the north and 400 feet on the south pier. For 1894 the recommendations of the previous annual report, in regard to the improvement of the harbor of refuge at Portage Lake, Michigan are renewed.

His recommendations in reference to Manistee harbor, Michigan for 1894 are for seven cribs 350 feet on the north pier and seven cribs 350 feet on the south pier, to complete the present project, \$84,000; for repairing 645 linear feet on the north pier, \$6,450; for repairing 500 linear feet on the north revetment, \$3,500, and for two season's dredging in the harbor, \$4,000, which with contingencies makes \$111,000.

His recommendations for 1894 for Muskegon harbor, Michigan, are for 322 linear feet, new superstructure, north pier \$3,220; for repairing north pile pier and revetment, \$700; for refilling both piers and rip-rapping end of south pier, \$1,500; for rebuilding 1,000 linear feet, sheet pile revetment, north side (timber and piles on hand), \$2,000; for 2,000 additional sheet pile revetment, (1,000 on each side) \$12,000; for ten new cribs on the north pier and ten on the south pier, \$120,000, and for dredging with 9 per cent. for contingencies, \$156,000 in all.

In Saugatuck harbor he recommends that 2,524 feet of the south pier should be rebuilt above the water's surface.

To complete the inner harbor at Michigan City, he says will require the removal of 135,000 cubic yards, at an estimated cost of \$15,000.

Whaleback Steamship Company.

The English Company organized by W. Johnston & Co. of Liverpool to build boats of the McDougall type will be known as the Whaleback Steamship Company, Limited. A prospectus announces that the capital is to be £250,000 of £10 shares and the company is "to acquire or build vessels of the type known as whalebacks, under patents granted in the United Kingdom, America and other foreign countries, to Alexander McDougall and others." The first subscribers are: W. Johnston, E. Johnston, E. Paul, H. L. Smith, all of Liverpool; C. Hoyt, 36 Wall street, New York; C. L. Colby, New York; A. McDougall, Duluth, and C. W. Wetmore, New York.

SEND 50 CENTS IN STAMPS TO THE MARINE REVIEW FOR TEN PHOTOTYPES AND GRAVURES OF LAKE STEAMERS NEATLY BOUND.

Record of Speed and Big Cargoes.

[Masters or owners are invited to report improvements on this list.]

Iron ore: Lake Michigan—Maryland, Inter-Ocean Transportation Company of Milwaukee, 3,663 gross, or 4,103 net tons, Escanaba to South Chicago, draft 17 feet 4 inches; Western Reserve, Peter Minch of Cleveland, 3,314 gross, or 3,717 net tons, Escanaba to Ashtabula.

Grain: E. C. Pope, Eddy Bros. of Bay City, 125,730 bushels of corn, Chicago to Buffalo, draft 14 feet 8 inches; Western Reserve, Peter Minch of Cleveland, 112,431 bushels of wheat, Chicago to Buffalo; W. H. Gilcher, J. C. Gilchrist of Cleveland, 114,982 bushels of corn, Chicago to Buffalo.

Speed: Owego, Union Line of Buffalo, Buffalo to Chicago, 889 miles, 54 hours and 16 minutes, 16.4 miles an hour; Saranac, Lehigh Valley Line of Buffalo, Buffalo to Lime-Kilns, 240 miles, 15 hours and 10 minutes, 16 miles an hour.

Iron Mining.

VALUE OF LEADING STOCKS.

Quoted by Chas. H. Potter & Co., No. 104 Superior St. Cleveland, O.

Stocks.	Par Value.	Bid.	Asked.
Cleveland-Cliffs Iron Company.....	\$100 00	\$.....	\$ 70 00
Champion Iron Company.....	25 00	.....	60 00
Chandler Iron Company.....	25 00	42 00	45 00
Jackson Iron Company.....	25 00	.....	100 00
Lake Superior Iron Company.....	25 00	43 00	45 00
Minnesota Iron Company.....	100 00	73 50	76 00
Pittsburgh & Lake Angeline Iron Co.....	25 00	.....	140 00
Republic Iron Company.....	25 00	.....	16 00
Ashland.....	25 00	.....	.....
Section Thirty-three.....	25 00	.....	7 50
Brotherton.....	25 00	2 00	2 50
Iron Belt.....	25 00	2 25	2 50
Aurora.....	25 00	8 25	.....

It is announced unofficially that the Cleveland-Cliffs Mining Company will begin payment of regular dividends in October. When the consolidation of the companies now known as the Cleveland-Cliffs took place it was generally understood that the intention was to place the two corporations on a solid financial basis, so as to insure a regular 6 per cent. dividend, and this announcement, coming as it does from very good authority, will be welcomed by stockholders who have all along recognized the reorganized company as one of the strongest in the Lake Superior district. News of the shutting down of the Champion and one or two other properties of less importance was not unexpected. A synopsis of the annual report of the Champion, printed in this column, shows very clearly the cause for this action. The Champion is a dry mine, however, and work can be suspended without great loss. Idleness will in all probability be only temporary. If a few other large mines similarly situated could follow the example of the Champion the effect on the market for iron ore would be to the advantage of producers.

The Champion mine, which has been at great disadvantage from high rail freights and the general lack of demand for hard ores, is known to have sold very little ore so far this season. In connection with the suspension of work recently at this property the following from the annual report of the treasurer, Mr. W. E. Stone, will prove interesting: "The past year (April 30, 1891, to April 30, 1892) has been one of continued and increased depression in the iron market, extremely low prices and limited sales. As was the case the year before, the mine has again produced more ore than we have been able to dispose of, so that our accumulation of unsold ore of a year ago has been still further increased. As the balance sheet shows, not only are all our surplus funds now invested in our stocks of unsold ore, but we have been obliged to borrow money to keep the mine in operation. The business of the past year shows a profit of \$68,616, and we have expended \$64,783 in completing the new plant of mining machinery. There is a remarkable improvement in the appearance and condition of the mine. The ore product was 199,703 tons, ore shipments were 132,083 tons, and the ore delivered on sales 129,427 tons. The balance sheet April 30, 1892, shows: Land and property, \$500,000; iron ore, \$634,992; mine inventory, \$13,547; cash, \$9,036; stock of Champion company, fifty shares, \$1,250; total \$1,222,074. Capital stock, \$500,000; bills payable, \$126,000; accounts payable, \$41,575; guaranty fund, \$271,304; depreciations, \$149,935; profit and loss, \$133,258; total, \$1,222,074." The agent, Mr. A. Kidder, says the railroad from the Champion mine to Huron bay on Lake Superior will be completed, with its ore docks,

this summer, and a rate of 40 cents per ton has been offered by its builders for freighting the Champion ore to water. With this reduced freight rate and the cost of ore brought down to, say \$2 to \$2.10, all kinds, with the greater part No. 1 quality, the Champion can compete successfully with any of the mines in this or neighboring districts.

Ferdinand Schlesinger of the Chapin Mining Company is trying to purchase the flooded Ludington and Hamilton mines. The water in these mines, which are adjacent to the big Chapin, are a source of some danger to the latter, but the Chapin with its powerful pumping apparatus could handle the flooded properties without great difficulty. The ores of both the Hamilton and the Ludington are of high quality. The Hamilton, on which an option to Mr. Schlesinger is reported to have been granted, is probably the deepest mine in the world. Several years ago a shaft at the Hamilton was sunk to a distance of 1,425 feet. In sinking a second shaft last fall, and when a depth almost equal to the first shaft was reached, water was encountered which flooded both the Hamilton and the Ludington.

If the mining leases made by Mesaba range companies are at all substantial some serious competition may be looked for from the new Minnesota iron district next year. Contracts entered into so far require a minimum output of 725,000 gross tons of ore, beginning next January. The royalty is reported at about 50 cents a ton on all Bessemer ore and 35 cents on non-Bessemer. One of the latest of these leases is between the Oliver Steel and Iron Company of Pittsburgh and the Camden Iron Company. In this case a minimum annual output of 25,000 tons is guaranteed.

It is not probable that the additional working capital put into the Pioneer mine, Vermillion range, by Capt. Thomas Wilson and Oglebay, Norton & Co. of Cleveland will result in a very large output from that mine this season. New shafts must be sunk, and it will probably be six months or more before any ore can be secured from new workings of this kind. Leaders in the reorganized company are undoubtedly of the opinion that they will find the vein of the Chandler, which adjoins the Pioneer.

The Minnesota Iron Company contemplates starting another diamond drill on underground work. The company had running at one time ten drills, but at present only five are in operation. W. H. Cole, superintendent of drill work, states that this is partially due to the fact that carbons are now very high, \$16 a karat. Carbons have been up to \$23, but the average price is \$12. The market is almost exclusively controlled by Parisian Jews.—Vermillion Iron Journal.

In and Out of the Cordage Trust.

As far as known the following concerns are with the National Cordage Company: Miamisburg Binder Twine and Cordage Company, Miamisburg, O.; Miamisburg Cordage Company, Miamisburg, O.; American Cordage Company, Xenia, O.; William Deering & Co., Chicago, Ill.; Middletown Twine and Cordage Company, Middletown, O.; Boston Cordage Company, Boston, Mass.; Standard Cordage Company, Boston, Mass.; Chelsea Cordage Company, Chelsea, Mass.; Sewall & Day Cordage Company, Boston, Mass.; New Bedford Cordage Company, New Bedford, Mass.; J. T. Donnell & Co., Boston, Mass.; Hingham Cordage Company, Hingham, Mass.; William Wall's Sons, New York, N. Y.; Tucker & Carter Cordage Company, New York, N. Y.; L. Waterbury & Co., New York, N. Y.; Elizabethport Steam Cordage Company, Elizabethport, N. J.; New York Bagging Company, New York, N. Y.; D. Allen & Sons, New York, N. Y. The following concerns are supposed to be in every way free and independent of the National Cordage Company: Aultman, Miller & Co., Akron, O.; Kingman & Co., Peoria, Ill., (Peoria Cordage Company); Hoover & Allison, Xenia, O.; Edwin H. Fitler & Co., Philadelphia, Pa.; Miamisburg Twine and Cordage Company, Miamisburg, O.; D. M. Osborne & Co., Auburn, N. Y.; Pearson Cordage Company, Boston, Mass.; John Good, New York, N. Y.; Ludlow Manufacturing Company, Boston, Mass.; Travers Bros. & Co., New York, N. Y.; Hinckley Bros., new mill at Newburyport, Mass.—Congressional Record.

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Places of Refuge for Sick and Disabled Sailors.

The United States marine hospital service has entered into contracts for the care of sick and disabled sailors in different parts of the country during the coming year. The full list of contracts on the lakes is as follows:

Ashland, Wis.—St. Joseph's Hospital to furnish quarters, subsistence, nursing, medical attendance and medicines at \$1 per day.

Ashtabula, O.—The medical attendance to be furnished by an acting assistant surgeon; Mrs. Henry Whelpley to furnish quarters, subsistence and nursing at \$1 per day; contagious diseases, \$1.50 per day; John Ducro & Sons to provide for the burial of deceased patients at \$14 each. Patients requiring long continued hospital treatment will be furnished transportation to Cleveland.

Buffalo.—Medical attendance to be furnished by a medical officer of the marine hospital service; Buffalo Hospital (Sisters of Charity) to furnish quarters, subsistence, nursing and medicines at 80 cents per day; and to provide for the burial of deceased patients at \$10 each.

Chicago—Hospital patients to be cared for in the United States marine hospital; Theodore Speaber to provide for the burial of deceased patients at \$19 each.

Cleveland—Medical attendance to be furnished by a medical officer of the marine hospital service; the Cleveland City Hospital Association to furnish quarters, subsistence, nursing and medicines in the United States marine hospital, under lease of Sept. 21, 1875, at 64 cents per day; the hospital to be kept in repair by the association; Flynn, Abel & Froelk to provide for the burial of deceased patients at \$7.95 each.

Detroit.—Hospital patients to be cared for at the United States marine hospital; out patients to be treated at the dispensary, No. 90 Griswold street; F. G. Marshall to provide for the burial of deceased patients at \$9 each.

Duluth, Minn.—Medical attendance to be furnished by an acting assistant surgeon; St. Luke's Hospital to furnish quarters, subsistence, nursing and medicines at 90 cents per day; John W. Stewart to provide for the burial of deceased patients at \$15 each.

Erie, Pa.—Medical attendance to be furnished by an acting assistant surgeon; Hamot Hospital Association to furnish quarters, subsistence and nursing at 71 cents per day; patients requiring long continued hospital treatment will be furnished transportation to the United States marine hospital at Detroit.

Escanaba, Mich.—Medical attendance to be furnished by an acting assistant surgeon; Delta County Hospital to furnish quarters, subsistence and nursing at \$1 per day.

Grand Haven, Mich.—Medical attendance to be furnished by an acting assistant surgeon; Nancy Palmer to furnish quarters, subsistence and nursing at \$1 per day.

Green Bay, Wis.—Medical attendance to be furnished by an acting assistant surgeon; St. Vincent Hospital to furnish quarters, subsistence, nursing and medicines at \$1 per day; contagious diseases at \$3 per day; Lefebore & Schumacher to provide for the burial of deceased patients at \$16 each.

Ludington, Mich.—Medical attendance to be furnished by an acting assistant surgeon; Hanibal D. Lindsley to furnish quarters, subsistence and nursing at \$1 per day.

Manistee, Mich.—Medical attendance to be furnished by an acting assistant surgeon; Mercy Hospital to furnish quarters, subsistence, nursing and medicines at 90 cents per day.

Marquette, Mich.—Medical attendance to be furnished by an acting assistant surgeon; St. Mary's Hospital to furnish quarters, subsistence and nursing at \$1 per day, and to provide for the burial of deceased patients at \$15 each.

Michigan City, Ind.—Medical attendance to be furnished by an acting assistant surgeon; seamen requiring hospital treatment must make application at the United States marine hospital at Chicago.

Milwaukee—Medical attendance to be furnished by an acting assistant surgeon; out patients to be treated at No. 159 Wisconsin street; St. Mary's Hospital to furnish quarters, subsistence and medicines at 80 cents per day; George L. Thomas to provide for the burial of deceased patients at \$16 each; chronic hospital patients to be furnished transportation to the United States marine hospital at Chicago.

Ogdensburg, N. Y.—Medical attendance to be furnished by an acting assistant surgeon; the City Hospital to furnish quarters, subsistence, medicines and nursing at \$1.25 per day; and to provide for the burial of the deceased patients at \$15 each.

Oswego, N. Y.—Medical attendance to be furnished by an acting assistant surgeon; the Oswego Hospital to furnish quarters, subsistence, nursing and medicines at \$1.25 per day.

Port Huron, Mich.—Medical attendance to be furnished by an acting assistant surgeon; the Hospital and Home to furnish quarters, subsistence, nursing and medicines at \$1 per day. Patients requiring long and continued hospital treatment will be furnished transportation to the United States marine

hospital at Detroit; George Thompson to provide for the burial of deceased patients at \$8 each.

Saginaw, Mich.—Medical attendance to be furnished by an acting assistant surgeon; the Good Samaritan Hospital to furnish quarters, subsistence, nursing and medicines at 72 cents per day. Patients requiring long continued hospital treatment to be furnished transportation to the United States marine hospital at Detroit.

Sandusky, O.—Medical attendance to be furnished by an acting assistant surgeon; the Good Samaritan Hospital to furnish quarters, subsistence and nursing at \$1 per day.

Sault Ste Marie, Mich.—Medical attendance to be furnished by an acting assistant surgeon; Annie McNeeley to furnish quarters, subsistence and nursing at \$1 per day; J. Vanderhook to provide for the burial of deceased patients at \$8 each.

Superior, Wis.—Medical attendance to be furnished by an acting assistant surgeon.

Toledo, O.—Medical attendance to be furnished by an acting assistant surgeon; St. Vincent Hospital to furnish quarters, subsistence, nursing and medicines at 80 cents per day; contagious diseases, \$2 per day; and to provide for the burial of deceased patients at \$15 each.

Official Numbers and Tonnage.

The bureau of navigation, E. C. O'Brien commissioner, approved of tonnage measurements and assigned official numbers to the following lake vessels during the week ending Saturday, July 30: Steam—City of Genoa, built at Bay City, Mich., and hailing from Port Huron, Mich., 2,109.90 tons gross, 1,773.06 net, No. 126,897; Pathfinder, hailing from Cleveland and built at Superior, Wis., 2,424.60 tons gross, 1,761.76 net, No. 150,598; Charles P. Stricker, hailing from Erie, Pa., and built at Buffalo, 13.99 tons gross, 7.00 net, No. 126,898; E. E. Hall, hailing from Oswego, N. Y., and built at Skaneateles, N. Y., 12.50 tons gross, 6.25 net, No. 136,311. Sail and unrigged—Sagamore, hailing from Cleveland, O., and built at Superior, Wis., 1,601.40 tons gross, 1,557.31 net, No. 57,932; Chicago, hailing from Chicago, and built at the same port, 6.76 tons gross, 6.42 net, No. 125,448.

Grain at Chicago and Duluth.

Stocks of grain at Chicago and Duluth on Monday, Aug. 1, were as follows:

	Chicago.		Duluth.
	Wheat, bu.	Corn, bu.	All wheat, bu.
In store.....	3,944,613	4,012,125	2,804,000
Same time last year.....	3,107,348	1,306,040	.....
Decrease during the week.....	454,833	.....	558,000
Increase during the week.....	.....	100,969	.....

In addition to the above there is 1,734,130 bushels of oats, 98,362 bushels of rye and 24,075 bushels of barley in store at Chicago.

Work of the Ship Yards.

Of course the intelligent readers of last week's REVIEW understood that it was an error of the types that caused the statement that the big steel steamer to be built by F. W. Wheeler & Co. of West Bay City for the Hawgood & Avery Transit Company of Cleveland, would have but two instead of three boilers. Two boilers 12½ feet in diameter by 12 feet long would not be suited to the power required in a steamer 377.6 feet over all.

All four of the light-ships building by F. W. Wheeler & Co. for the United States government will soon have left the West Bay City yard of that company, and the big steel tug for coast service is also well under way, completing the contracts of last winter, but the firm is enabled to continue active building operations at its steel plant, as the big steamer for the Hawgood & Avery company and the duplicate of the steamer Gilbert for the Gratwick-Mitchell syndicate, owners of the Sauber, are important contracts.

The Pirate, or United States cruiser No. 12, planned to be the greatest commerce destroyer afloat, was successfully launched last week from the ship yard of W. H. Cramp & Sons, Philadelphia, Pa. The Pirate is an armored vessel, 412 feet long and 58 feet breadth, and is calculated to attain a speed of 21 knots, with engines of 21,000 indicated horse power. The vessel throughout is provided with pumps furnished by the George F. Blake Manufacturing Company of New York. The fire and bilge pumps and boiler feed pumps are the vertical duplex pattern of that company's latest design. The three engine rooms are provided each with a separate independent vertical double cylinder air pump, each air pump capable of taking care of 7,000 horse power. Floor space occupied by these pumps is 38x71 inches.

The Great Chicago-Mississippi Waterway.

Chicago has surprised the world in many wonderful undertakings of late, and not least among them is the proposed waterway from that city to the Mississippi river, upon which contracts for one section, involving \$10,696,755, were let a short time ago. In letting these contracts the drainage board in charge of the great sewer, as it is now commonly called, has shown considerable boldness. As it is claimed that this waterway will serve the twofold purpose of diluting Chicago sewage and for future commerce between the lakes and the Mississippi, some details regarding the plans upon which work has been begun will probably be of interest at this time. The canal will have a width at bottom of 160 feet and a uniform depth of 19 feet, a gradient of five inches to the mile and a capacity of 600,000 cubic feet per minute. The Suez canal has a bottom width of 72 feet, just sufficient for one large steamer. It is in fact a "single-track" canal with turnouts; the Chicago canal will be "double track." The Suez canal has a top width of 197 feet, the depth in center being 26 feet, or 7 feet more than that of the Chicago canal. The superior dimensions of the Chicago canal were not so much demanded in the interests of navigation as in that of sewage disposal, the law demanding as it does a water supply for diluting Chicago's present and future excreta to the enormous amount of 600,000 cubic feet per minute. The position of the present work is neither the beginning nor the end of the programme of the sanitary commission. It is a stretch of fourteen miles of heavy cutting across what is called the Chicago divide or "height of land." It commences at a village called Willow Springs, twenty miles from Chicago court house, close to the present Illinois and Michigan canal, and runs in a southwesterly direction to Lockport, a town three miles from Joliet. The total length of cutting will be fourteen miles, the maximum depth in rock about 35 feet, and in clay about the same.

Difficulties to be met with in this project are of course very numerous. It will involve a most prodigious expenditure, and notwithstanding the claims of its promoters that it is intended as a highway of commerce all attempts to secure appropriations from the general government will be stubbornly fought. The local government engineer, Capt. Marshall, has already opposed the application of Chicago for government grants in aid of the enterprise, considering as he does that to do so would be to apply federal money to municipal purposes. Careful study has shown that no positive detriment would result to lake shipping on account of the abstraction of so large an amount of water from Lake Michigan, but the great cost of securing an entrance to the city of Chicago and the lake, and the effect of such entrance on the transportation problem are all important questions. The present harbor entrance, narrow and with low banks, has been a barrier to rapid transit on account of the swing bridges which obstruct also the navigation. The programme of the sanitary board includes the entire filling up of this present harbor entrance, the creation of industrial properties on its site, and the facilitation of rapid transit across the new cuts by means of tunnels. Seeing that every street must have its tunnel, which will have to be about 1,500 feet long including approaches, in order to make one crossing of the same capacity as a present street, the cost will be about \$1,500 per lineal foot, or \$2,250,000 per street. This work alone would run into a big sum of money, and it is evident on every hand that in the matter of sewage disposal Chicago has an important subject to deal with.

In 268 B.C. Archimedes devised a marvelous ship for Hiero of Syracuse. Her three lofty masts had been brought from Britain. Luxuriously fitted sleeping apartments abounded and one of her banquet halls was paved with agate and costly Sicilian stone. Other floors were cunningly inlaid with scenes from the Iliad. Stables for many horses, ponds stocked with live fish, gardens watered by artificial rivulets and hot baths were provided for use or amusement. Ptolemy Philopater possessed a nuptial yacht, the Thalamegon, 312 feet long and 45 feet deep. A graceful gallery, supported by curiously carved columns, ran round the vessel, and within were temples of Venus and of Bacchus. Her masts were 100 feet high, her sails and cordage of royal purple hue.

In General.

The light-house tower at Cape Hatteras is 189 feet high from its base to the center of the lantern. It is the tallest light-house tower in existence.

Newspaperdom, a publication "for the makers of newspapers," has just issued its fourth number, but gives promise already of being the best journal of its kind ever produced in the country. It is a monthly, and Charles S. Patterson, World building, New York, is the publisher.

Norman L. Munro, the New York publisher, and owner of the fast little steamer Norwood, is again out with a challenge. He offers to wager from 5 cents to \$25,000 that the Norwood is the fastest boat under the sun for miles, or that she is the fastest steamer in America for one mile to eighty knots.

The cargo of 125,000 bushels of corn reported to have been taken out of Chicago Wednesday by the whaleback steamer Samuel Mather, does not break the record of big cargoes from that port. The steamer E. C. Pope last season delivered at Buffalo from Chicago 125,730 bushels of corn.

A Scotch shipbuilding firm recently built in twenty-three days a large gunboat for France, to be used on the Wheme river and coast lagoons, Africa. French shipbuilders wanted from four to ten months in which to do the work. The vessel will carry 400 soldiers, three cannons mounted on a bridge, and four rapid firing guns on the spar deck.

Speaking at the meeting of the Iron and Steel Institute at London, Mr. Andrew Carnegie said that an exhaustive series of tests just undertaken by the Pennsylvania Railway had placed basic steel alongside of acid steel for boilers and fire-boxes, and he had been informed that the question was being seriously entertained whether they would not specify that nothing but basic steel should be used for that purpose.

The whaleback steamer Joseph L. Colby is carrying fairly paying cargoes from points on the Gulf of Mexico and the Caribbean sea to Boston and Providence. With twenty-one hands aboard she carries almost 3,000 tons of Sisal hemp, and a cargo of cotton equal to those usually carried by steamers carrying from twenty-eight to thirty-two hands. The difference in the consumption of coal for power purposes is proportioned in about the same way. The two differences are enough to make up almost the entire difference in cost between operating American and foreign vessels.—American Shipbuilder.

Again the City of Paris has broken the Atlantic record. She made the trip from Queenstown to New York last week in five days, fifteen hours and forty-eight minutes. The best previous record was made by the Teutonic, of the White Star line, namely, five days, sixteen hours and thirty-one minutes. The City of Paris made also the best record of average knots per hour and the best average for a single day. The average number of knots per hour for the voyage was 20.48 as against the best previous average of 20.43 knots per hour. On one day during the voyage the steamer made a total of 520 knots, or 21.02 knots per hour for the day.

Referring to the claim that the recent triple launch at the yard of the American Steel Barge Company, West Superior, was the first and only triple launch taking place from one shipyard in this country. Wm. H. Webb, veteran shipbuilder, says in the Marine Journal of New York: "In the fifties, precise year not now recollected, I launched from my works on the East river, in the city of New York, three large vessels at one tide. They were the steamer Golden Gate, built for the Pacific Mail Steamship Company, clipper ship Gazelle, and Havre packet ship Samuel M. Fox. The last one was afloat in twenty minutes from the time the first one touched the water, and without any hitch or accident whatever."

Notice to Mariners.

On or about Aug. 16, Kalamazoo light, near the outer end of the south pier, will be discontinued as a pierhead light, and re-established without change of order or characteristic as a coast light in the old light-tower surmounting the keeper's dwelling on the north side of the mouth of the Kalamazoo river, Michigan. The height of the focal plane is 35 feet above the base of the tower and 53 feet above lake level. The light should be visible in clear weather, the observer's eye 15 feet above lake level, 14 $\frac{3}{4}$ statute miles.

MARINE REVIEW.

DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

JOHN M. MULROONEY, } PROPRIETORS.
F. M. BARTON, }
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The books of the United States treasury department contain the names of 3,600 vessels, measuring 1,154,870.38 tons in the lake trade. In classification of this fleet the lakes have more steamboats of 1,000 to 2,500 tons than the combined ownership of this class of vessels in all other sections of the country. The number of vessels of 1,000 to 2,500 tons on the lakes on June 30, 1891, was 310 and their aggregate gross tonnage 512,787.58; in all other parts of the country the number of this class of vessels was, on the same date, 213 and their gross tonnage 319,750.84. The classification of the entire lake fleet is as follows:

Class.	Number.	Tonnage.
Steam vessels.....	1,592	756,751.53
Sailing vessels.....	1,243	325,131.06
Canal boats.....	703	72,515.42
Barges.....	62	20,472.37
Total.....	3,600	1,154,870.38

Tonnage built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

	No. of boats.	Net Tonnage.
1887.....	152	56,488.32
1888.....	222	101,102.87
1889.....	225	107,080.30
1890.....	218	108,515.00
1891.....	204	111,856.45
Total.....	1,021	485,042.94

St. Mary's Falls and Suez canal traffic: Number of boats through St. Mary's Falls canal in 1890, 228 days of navigation, 10,557; tonnage, net registered, 8,454,435. Number of boats through Suez canal during 1890, full year, 3,389; tonnage, net registered, 6,890,014. Number of boats through St. Mary's Falls canal in 1891, 225 days of navigation, 10,191; tonnage, net registered, 8,400,685. Number of boats through Suez canal during 1891, full year, 4,207; tonnage, net registered, 8,698,777.

Entered at Cleveland Post Office as Second-class Mail Matter.

IN APRIL last the United States Senate asked the Secretary of War for a copy of the report and the proceedings before the board of engineer officers convened for the purpose of considering and determining as to the construction of a bridge across the canal through Minnesota point in the city of Duluth. The report was submitted a few days later, and was found to be adverse to the bridge project, on the ground that it would be a serious obstruction to navigation. Says the report, "If a bridge were authorized over the canal at Duluth there could be no reasonable objection to permitting such a structure at any other exposed harbor entrance on the lakes; and, without doubt, applications for authority to bridge over harbor entrances would rapidly follow upon the granting of such privilege at Duluth, thus leading to a condition which would be unendurable." Lobbyists sent to Washington by the municipal authorities have tried to overrule this report from the engineers, but Congress has refused to establish such a precedent. Now these same officials of Duluth, who are indebted to lake commerce for 90 per cent. of the great progress of their city within the past ten years, have the effrontery to declare that they will go ahead with the building of a bridge, notwithstanding the federal authority. They will find that they are treading upon dangerous ground, but their actions in this matter will nevertheless bear careful watching by lake shipping interests. Gen. Sooy-Smith, a civil engineer of Chicago whom the Duluth people have recently called to their assistance, is said to have given it as his opinion that the city should build a timbered tunnel. This could be done, he thinks, for about \$500,000. The cost of a tunnel with steel supports would be at least \$1,200,000.

FOR sensational newspaper stories Canada, as well as Chicago and other cities on this side of the border that are noted in

this line, can furnish its share of ridiculous reading matter. A dispatch from Ottawa a few days ago dealing with the canal tolls question announced that the British government was urging the government of Canada to hurry the work of deepening the St. Lawrence canals to 14 feet "that they might be available next year for the passage of British gunboats in event of their being required for lake service." Canada has been for years trying to raise money enough to complete the work of deepening these canals, and the shipping interests of the United States on the lakes will rejoice with the people of the Dominion when the dimensions of the Welland are made uniform throughout the St. Lawrence. Reciprocal trade relations in other directions will undoubtedly guarantee to the United States full use of the improved canals, but unfortunately the work still requires an expenditure of full \$12,000,000, and there is no telling when it will be completed.

APPROPRIATIONS for lake lights in the civil sundry appropriation bill will become available just as soon as the officers of the light-house board can formulate plans for the expenditures authorized in the act. Provision is made in the bill for maintenance of the float lights at the Lime-kilns crossing, and there seems to be no good reason why the government cannot relieve vessel owners of this expense at once. The small light-ships now in use at the crossing can probably be purchased at less cost than would be required to build new floats, and the appointment of the present keepers of these lights for the government service would undoubtedly be eminently satisfactory to the shipping interests. As regards the Bar point light, however, relief from the present private expense can hardly be expected until next season, as a new light-ship must be built for this point. Three sets of new ranges for the Detroit river, also provided for in the bill, can hardly be expected before next season.

ADVICES from Washington in another part of this issue are most encouraging regarding the case of Col. Ludlow and Commander Heyerman, recently removed from the light-house service on the lakes. As a result of Col. Ludlow's call to Washington by Secretary Elkins, the matter has again been taken up by the light-house board. This move is the result of persistent efforts on the part of lake shipping interests to secure for these officers a hearing on the St. Mary's river lighting question, and there is hope that not only will this hearing be granted, but that the officers will be reinstated as an act of justice.

EASTERN papers are liberal in their praises of the first of four steel light-ships built on the lakes by F. W. Wheeler & Co. of West Bay City, Mich., for coast service. The vessels are the finest of their kind in the world, but it is a mistake to say that they are the first steam light-ships of the continent. Three light-ships which took stations in the Straits of Mackinac last fall are provided with power for propelling purposes in going to and from their stations, and the same power is used for the fog signal apparatus which they carry.

Lloyds Supplement for August.

The names of seven new boats are contained in the August supplement to the Inland Lloyds Register. Three are of iron and four of wood, the iron tonnage amounting to more than half of the aggregate of 6,130 net tons, and covering two-thirds of the valuation of \$666,000. In the August supplement for 1891 the tonnage of new vessels was 7,148 net, and the valuation \$555,000. The new vessels with tonnage, etc., are:

Name.	Port of hail.	Owner.	Net tonnage.	Valuation.
Adele.....	Grand Rapids, Mich.	D. A. Blodgett.....	18	\$ 9,000
City of Venice.....	Bay City, Mich.	James Davidson.....	1,771	135,000
Desmond.....	Port Huron, Mich.	Jenks Ship Building Co.	355	35,000
John B. Ketcham.....	Toledo, O.	Craig Ship Building Co.	780	75,000
Musie.....	South Haven, Mich.	Ed. E. Napier.....	64	12,000
Pillsbury.....	Buffalo, N. Y.	Minn. St. P. & B. S. S. Co.	1,571	200,000
Washburn.....	Buffalo, N. Y.	Minn. St. P. & B. S. S. Co.	1,571	200,000
			6,130	\$666,000



During July 44,750,000 feet of lumber, 4,000,000 shingles and 3,400,000 of lath were shipped from the Saginaw river.

Shipments of hard coal from Buffalo during July aggregated 402,000 tons, making the total for the season 1,162,100, or a gain of 40,000 tons over the corresponding date in 1891.

Again the steamer Maryland has beaten her own record in big cargoes between Escanaba and South Chicago. On a draft of 17 feet 4 inches, a few days ago, she took on a cargo of 3,663 gross or 4,103 net tons.

On her first trip from Escanaba the new schooner John C. Fitzpatrick, consort of the steamer George T. Hope, loaded a cargo of 2,396 gross tons of ore. This boat was built by F. W. Wheeler & Co. of West Bay City and is owned by John C. Fitzpatrick of Cleveland. She is only 242 feet keel.

On a draft of 16 feet 2 inches the new wooden steamer Iroquois, a boat of only 244 feet keel, has just delivered at Buffalo from Escanaba 2,594 gross tons of ore. The Iroquois is owned by Curtis & Brainard of Toledo and was built at their ship yard in Marine City. She is certainly a wonderful carrier for a wooden boat of her size.

Buffalo freight handlers complain that great difficulty is found in unloading the new whaleback package freight steamer Washburn. Gangways are of necessity very small and near the water line. It is claimed that twenty-four hours were required to unload 500 tons of general merchandise taken to Buffalo on the boat's first trip.

According to custom house measurement the gross tonnage of Mr. Samuel Mather's whaleback steamer Pathfinder, now nearing completion at the shipyard of the American Steel Barge Company, West Superior, is 2,424.60 and the net tonnage 1,761.76. The Sagamore, consort of the Pathfinder, is 1,801.40 tons gross and 1,551.31 net.

Members of the life saving service in different parts of the lakes express their gratitude to Capt. John D. Persons of the Thunder bay island station, Lake Huron, for an active part taken in securing the passage of the act for increased pay. He sent out to keepers and vessel owners in all parts of the country hundreds of circulars, letters and petitions favoring the measure.

In October, 1887, the Canadian Steamer City of Owen Sound with a cargo of grain was sunk in Georgian bay, a short distance inside of Cove island passage. The boat was raised a few days ago by the Collins' Bay Rafting and Wrecking Company by means of pontoons, and as she is said to have been in 110 feet of water the work has attracted attention. The pontoons used are the invention of William Leslie, of Kingston, Ont., manager of the wrecking company. This was the second trial of the invention, the first being the railway transfer steamer Armstrong, which was sunk in very deep water at Brockville. The experience obtained in that case convinced Mr. Leslie that the only weak point in his invention was that the pontoons were too large, their lifting capacity being so great as to break the strongest chains he could use. He afterward reduced their size one half. They are 46 feet in length and about ten feet in diameter, perfectly cylindrical in form, with cigar-shaped ends, divided into three compartments by water-tight bulkheads. They are built of heavy steel plate and strengthened with longitudinal and cross braces. To prevent undue rolling the pontoons are built with bilge keels and have a well near each end through which the chains are brought up and effectively held by toggles. The lifting capacity is 100 tons.

The rudder of the French iron-clad Brennus, launched some time ago at Lorient, is 18 feet high, 13 feet wide, and weighs 17 tons. In transporting it from the shops where it was made to the ship yard it was necessary to suspend it between two flat cars, as it could not be placed on a single car in any position. This great rudder was built with an interior frame of wrought steel, iron angles and plates, extraordinary care being taken to have it perfectly water-tight.

When Lake Vessels Frequently Crossed The Atlantic.

In discussing the recent trip of the steamer Wergeland from Norway to Chicago, a correspondent in Fairplay of London refers to navigation on the lakes in the early 60's. when voyages through the St. Lawrence river and canals to and from the various ports on the other side of the Atlantic were not uncommon. He says: "I have known of many lake vessels that crossed and re-crossed the Atlantic over 30 years ago, and know of one that loaded in Kingston and Montreal, went to Liverpool, thence to Bombay and back to Liverpool, where she was sold thirty-three years ago. I remember a full-rigged ship that was built in Toronto, Ont., thirty-five years ago. I myself sailed as mate in a small top-sail schooner, 148 tons register, from Toronto to Liverpool, discharged and refitted the vessel, loaded a cargo at Liverpool for Cadiz, there landed a cargo for Rio Grande do Sul, loaded again for Liverpool, and then loaded a return cargo for Toronto. The round was done within twelve months. Five years afterwards I sailed with the same captain in a twin-screw steamer built and engined at Brockville, on the St. Lawrence. We loaded at Montreal for London, discharged in the Surrey canal dock, loaded in the West India dock for Montreal, then proceeded up to the lakes, where the vessel was employed for the balance of the season, and several years after. The voyage from Montreal to London included calling at Cardiff for bunkers, and only occupied two months and six days. I personally know of a large shipowner, now in London, who sent several vessels across the Atlantic with his own cargoes; one, the Jessie Drummond, I think, went to Hamburg. I could give you the names of over fifty vessels that I know of myself, that crossed and re-crossed the Atlantic, that were built and owned on the lakes."

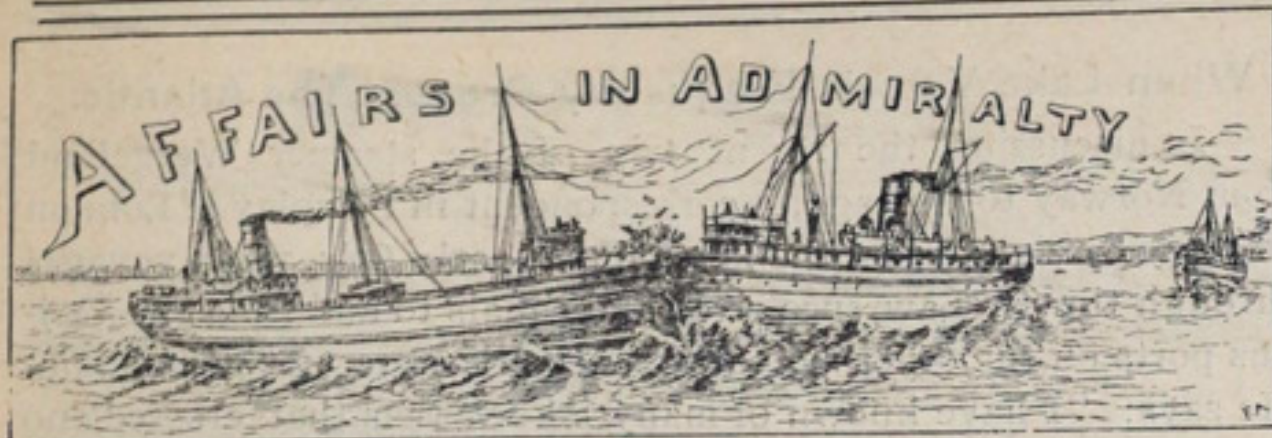
Electrical Terms.

At the present time electricity depends upon steam engineering for its generation. Therefore it behooves every live engineer to acquire all the knowledge regarding its generation and application that he possibly can. At the present time nearly all our ocean, river and lake steamers are equipped with dynamos for electric lighting, and the engineer who does not acquire knowledge necessary to care for the dynamos and its appliances will find hard work to procure a position. Engineers will find herein the electrical terms so clearly defined that any person can easily understand them: Volt, unit of pressure, called electric motor force, same as pounds of steam; ampere, unit of quantity, called current, same as gallons of water; ohm, unit of resistance, similar to friction; watt, unit of energy consumed, similar to foot pounds, and thus 746 watts equal one horse power, same as 33,000 foot pounds.

The whole question of electrical distribution may be popularly illustrated by its analogy to hydraulics. The dynamo is essentially a rotary pump, but pumping electricity instead of water. If the discharge pipe of a rotary pump be carried around through a given circuit and connected with a suction, both pump and pipes being full of water, the movement of the pump will obviously cause the water to flow in one direction, producing a continuous current of water. Substitute dynamo for pump, wire for pipe and electricity for water, and conception of electrical transmission by the continuous current is at once clear as to its elementary phenomena. We will bracket the analogous electrical terms; then we may say that a certain number of pounds (volts) of pressure are required to overcome the friction (resistance) of the pipe (wire) in order that the water (current) may flow at the rate of so many gallons (amperes) per minute. The larger the pipe (wire) the more water (current) can be carried and the less will be the friction (resistance); or per contra, the smaller the pipe (wire) the less the quantity (amperes) per minute and the greater the friction (resistance). Manifestly the pipe (wire) might be so small that the friction (resistance) would absorb a very large proportion of the power of the pump (dynamo) leaving but little remaining for useful effect, therefore the two horns of the dilemma are: If the pipe (wire) be too large it will cost too much; if too small the loss will be too great.

The electrical appliances are also analogous to engineering appliances. The switches are valves, the fusible strips are the safety-valves, the contacts are the pipe fittings. If the contact is insufficient to carry the current there will be a leak (drop) in the current. The volt meter is the pressure gauge; the ammeter is the same as the water or gas meter, the recorder of quantity consumed.

R. G. DAVIS, Marine Engineer.



United States District Judge Swan of Detroit has not as yet rendered decisions in several cases argued before him early last spring. Considerable interest is attached to these decisions on account of delay in rendering them, but there is little in lake admiralty affairs outside of these Detroit cases to come up until next winter. The famous North Star-Sheffield collision case may be argued before Circuit Judge Jackson during the present month, with C. E. Kremer and Robert Rae of Chicago representing the North Star and Harvey D. Goulder of Cleveland the Sheffield, but even this is doubted on account of the attorneys in this case being greatly overworked during the greater portion of the year and desiring to secure some rest in the warm summer season. Representatives of owners and underwriters of the Menominee line steamer Briton, which ran into and sunk the steamer Progress in the Detroit river a short time ago, met in Cleveland Wednesday to talk over the collision. An effort has been made to settle out of court the Aurora-Peck collision case but so far little progress in the matter is reported. This is the well known Mud lake collision case that resulted in a loss of about \$100,000 on the Peck and serious delay to Lake Superior navigation.

The draft of water at shoal places in the connecting rivers of the lakes and at the entrances to many lake harbors varies with weather conditions. This is also true of the sand bar outside the harbor of Galveston, Texas. The following synopsis

of a decision by United States District Judge Hughes, in the circuit court of appeals, fourth circuit, will accordingly prove interesting: "The schooner R. D. Bidder loaded with a cargo of rails, transported under a bill of lading which excepted liability from dangers of the seas, arrived off the bar at Galveston harbor. Quicksands cause the depth of water on this bar to constantly vary, and it is not uncommon for vessels to ground in crossing. The master consulted with the local pilots and with his broker, and by their advice lightered 100 tons of his cargo. Being then assured that the vessel would cross in safety, he proceeded in charge of a pilot, but the vessel, from some unknown cause, went fast aground. That night a storm arose, which lasted two days, and drove the vessel half a mile from the channel and on some shoals. From there she was afterward taken off by salvors. The cargo owner paid salvage on the cargo and brought suit against the vessel to recover the same, alleging that the stranding was caused by negligence of the master in not further lightering the schooner before attempting the bar. Held by the court that the grounding of the vessel was not due to negligence of her master; that even were it due to his negligence, still that was a remote cause of the salvage service, the proximate cause, which alone the court regards, being the storm, and from damage caused by that her bill of lading protected the ship."

The Continental Iron Works, Brooklyn, N. Y., has just issued a handsome thirty-six page catalogue, which contains much interesting and instructive data concerning the corrugated furnaces which they manufacture, and also excellent half-tone engravings of the furnaces manufactured by them for the United States cruisers Baltimore, San Francisco, Philadelphia, Newark, United States gunboats Yorktown, Concord and Bennington, the United States practice vessel recently built by Saml. L. Moore & Sons Co., and several others. The catalogue also contains the names of the many vessels fitted with these furnaces. This company is the sole manufacturer in the United States of corrugated furnaces, and was awarded the great medal of honor by the American Institute in 1887 for corrugated steel boiler furnaces, steel forgings and welded vessels.

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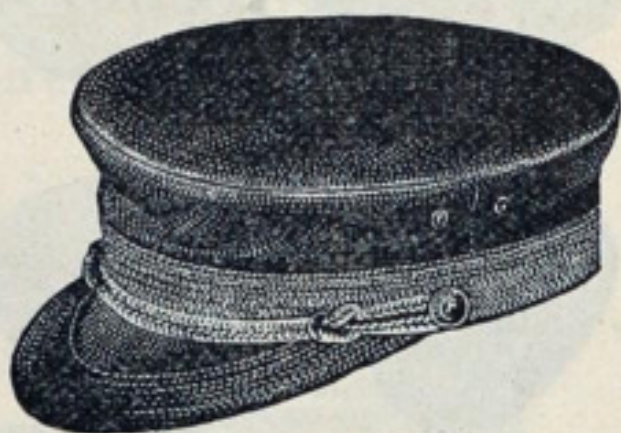
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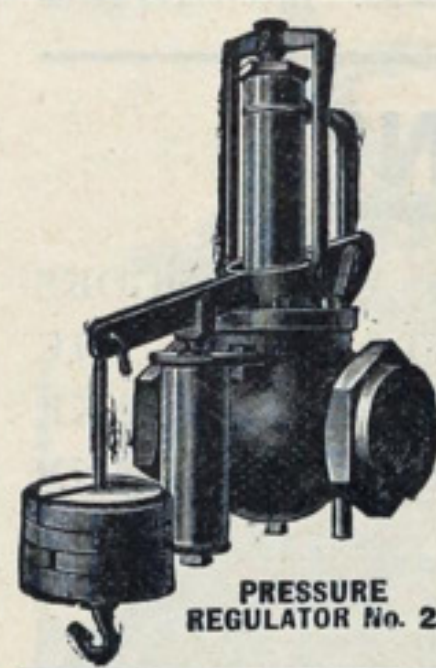
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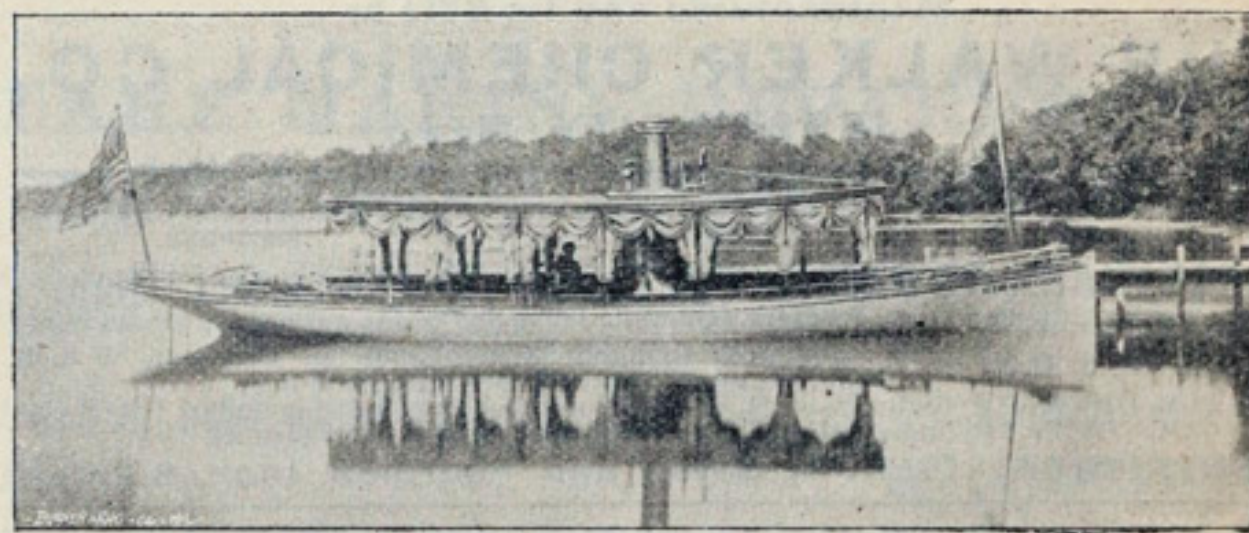
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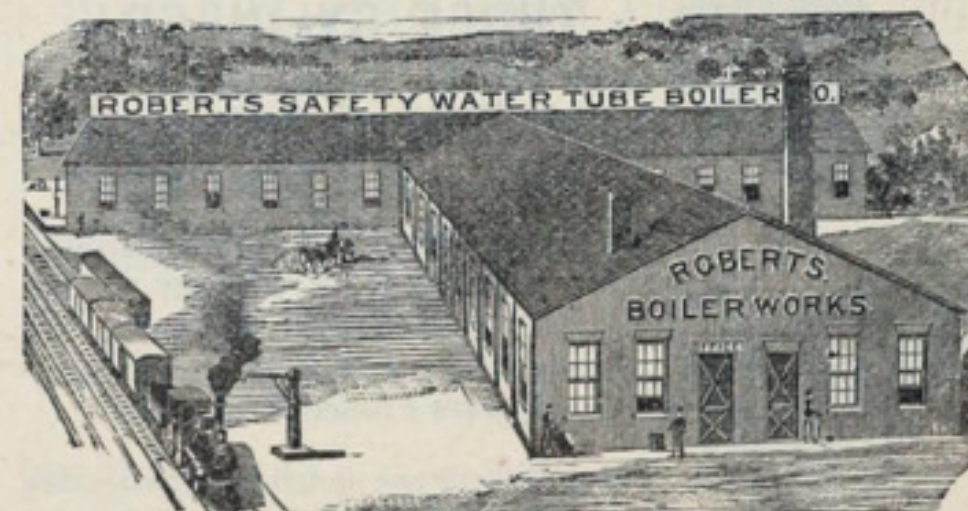
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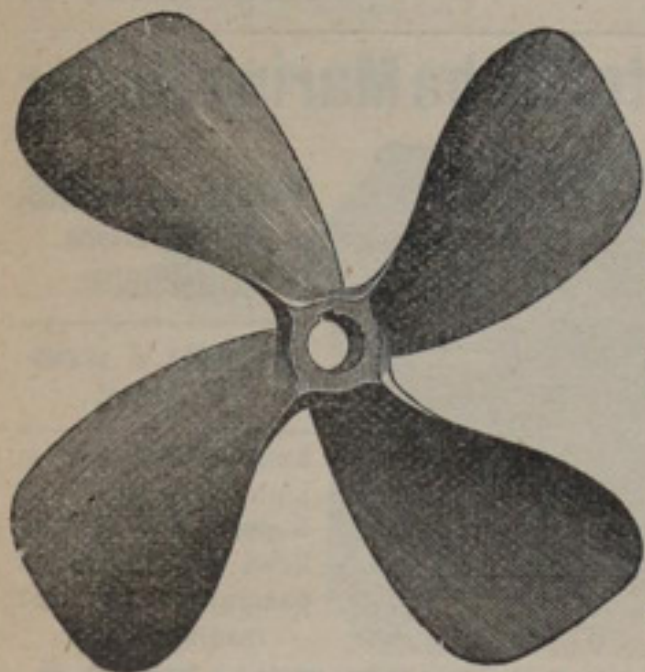
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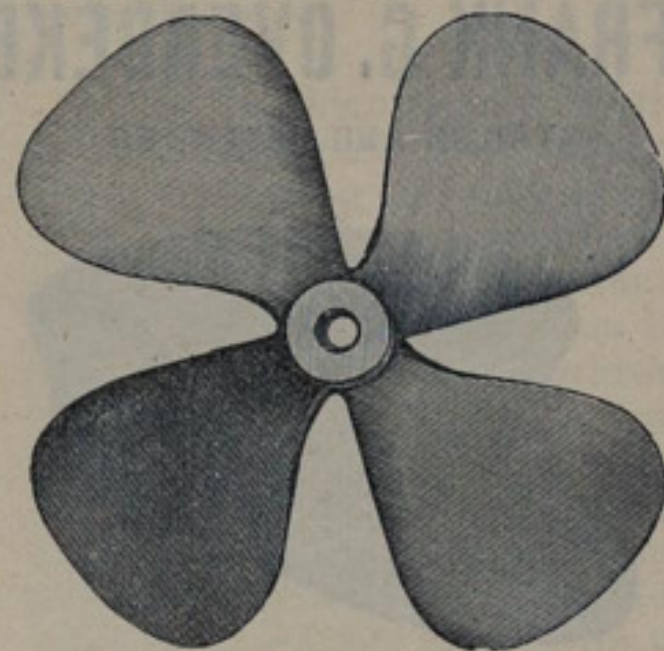
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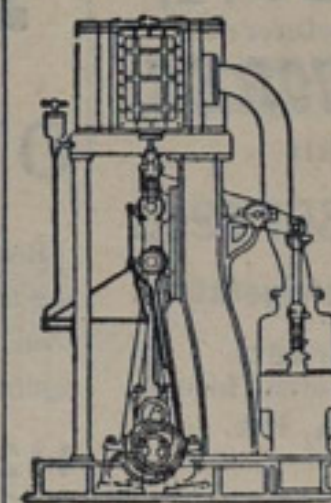
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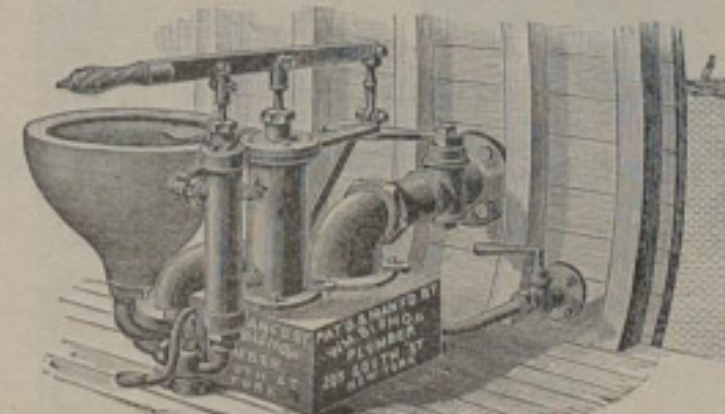
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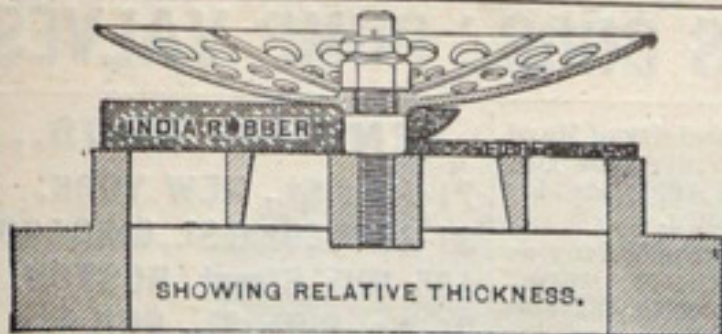
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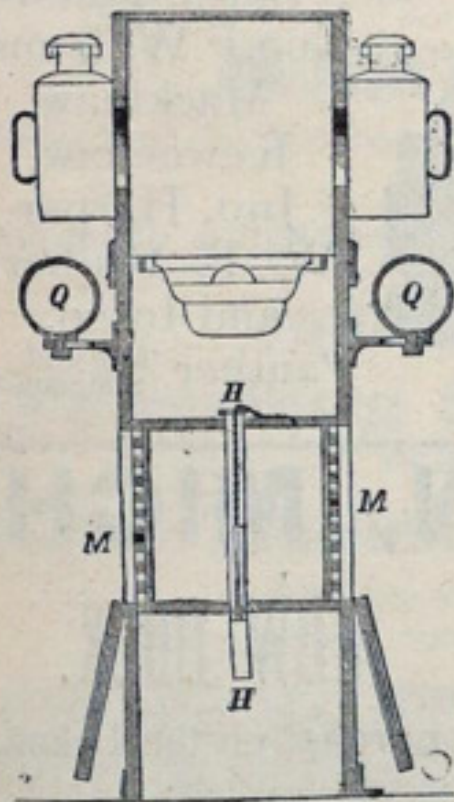
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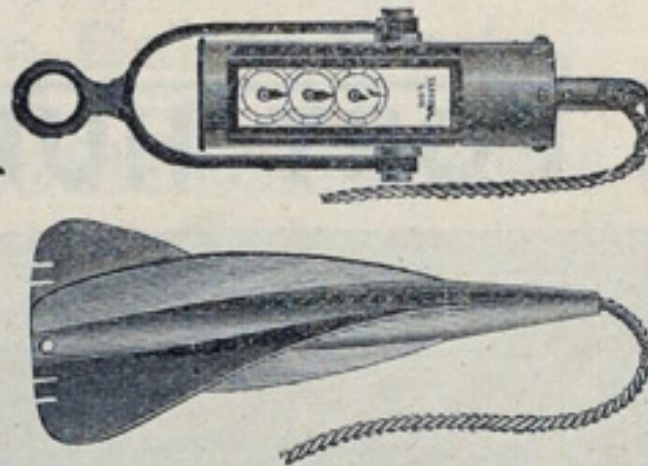
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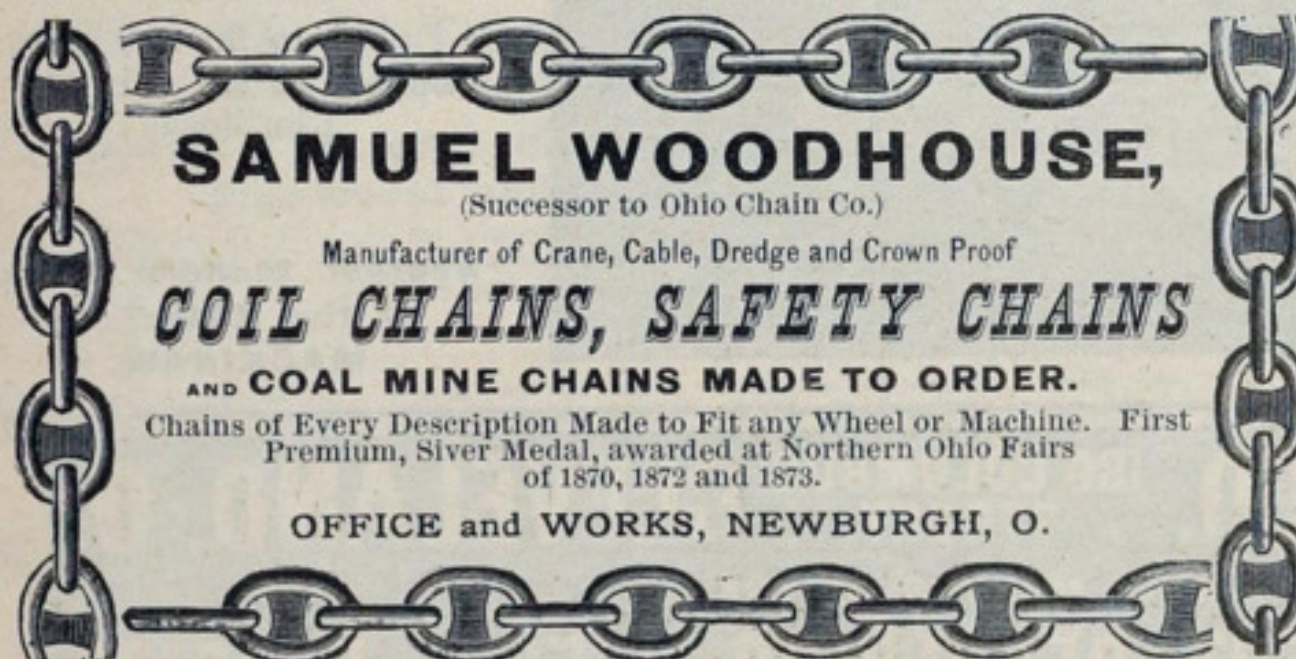


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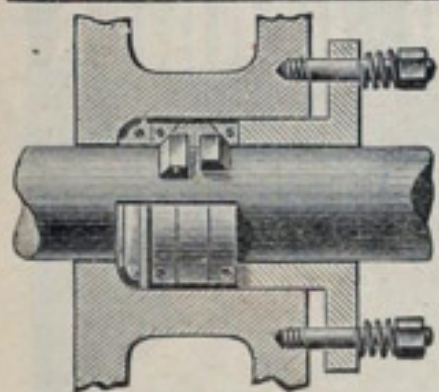
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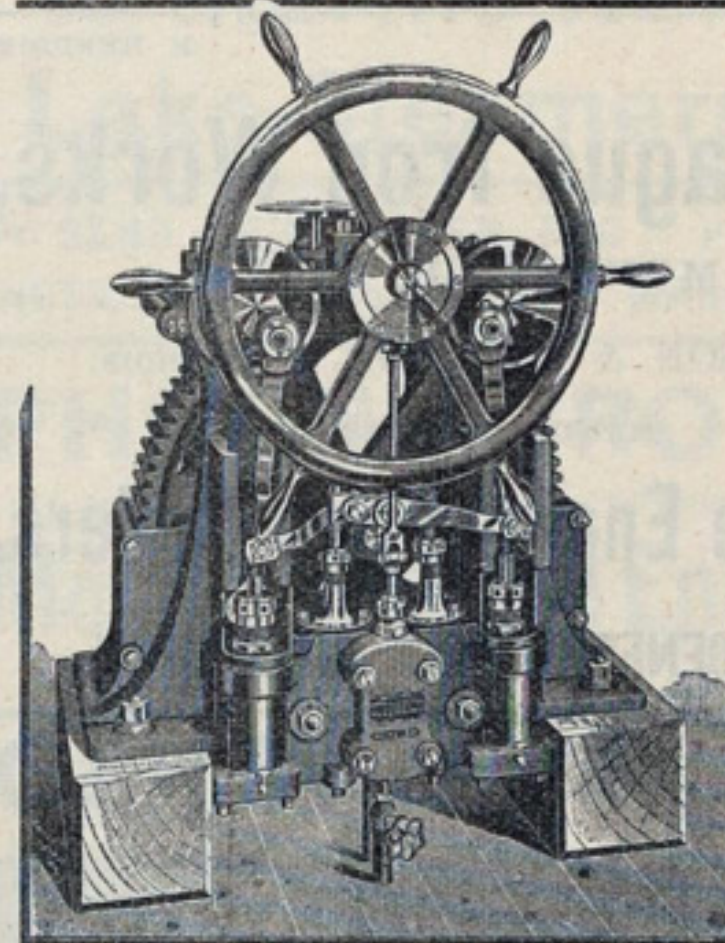
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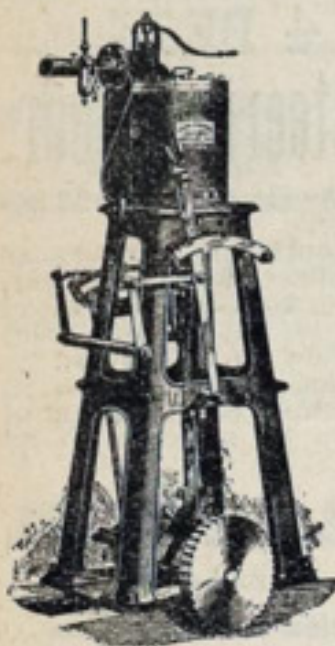
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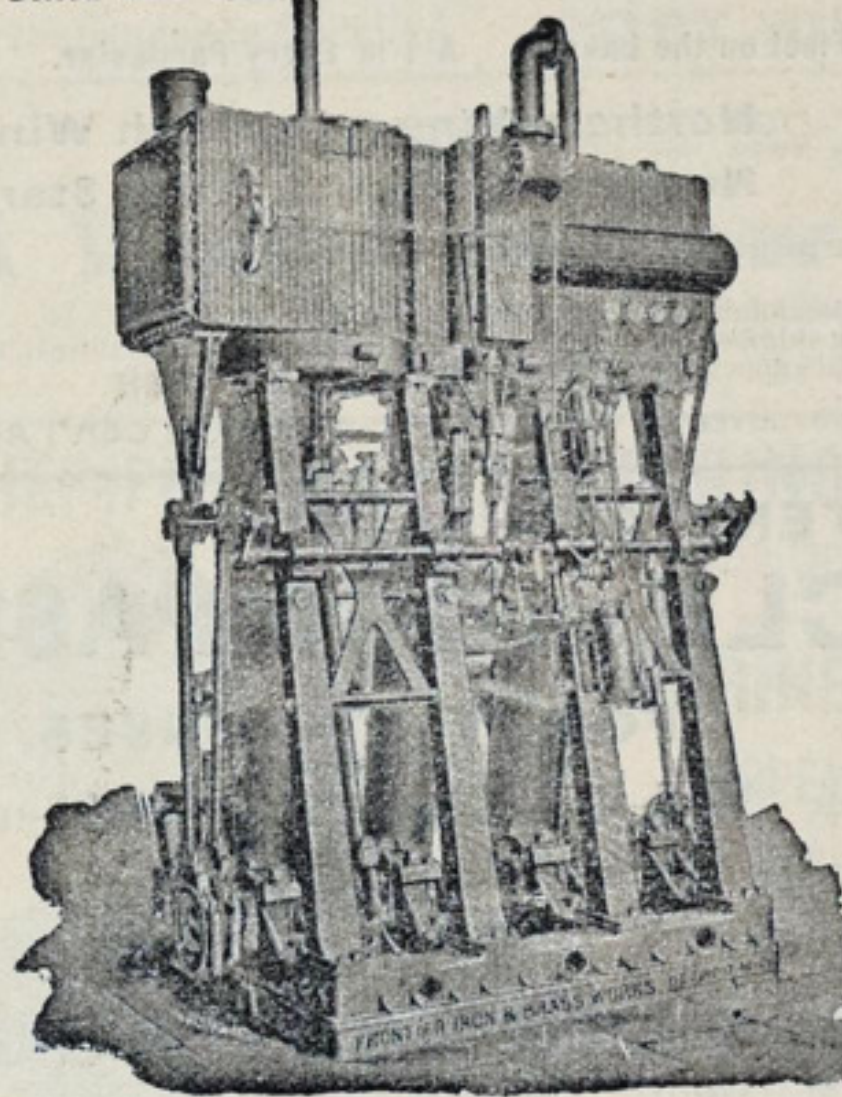
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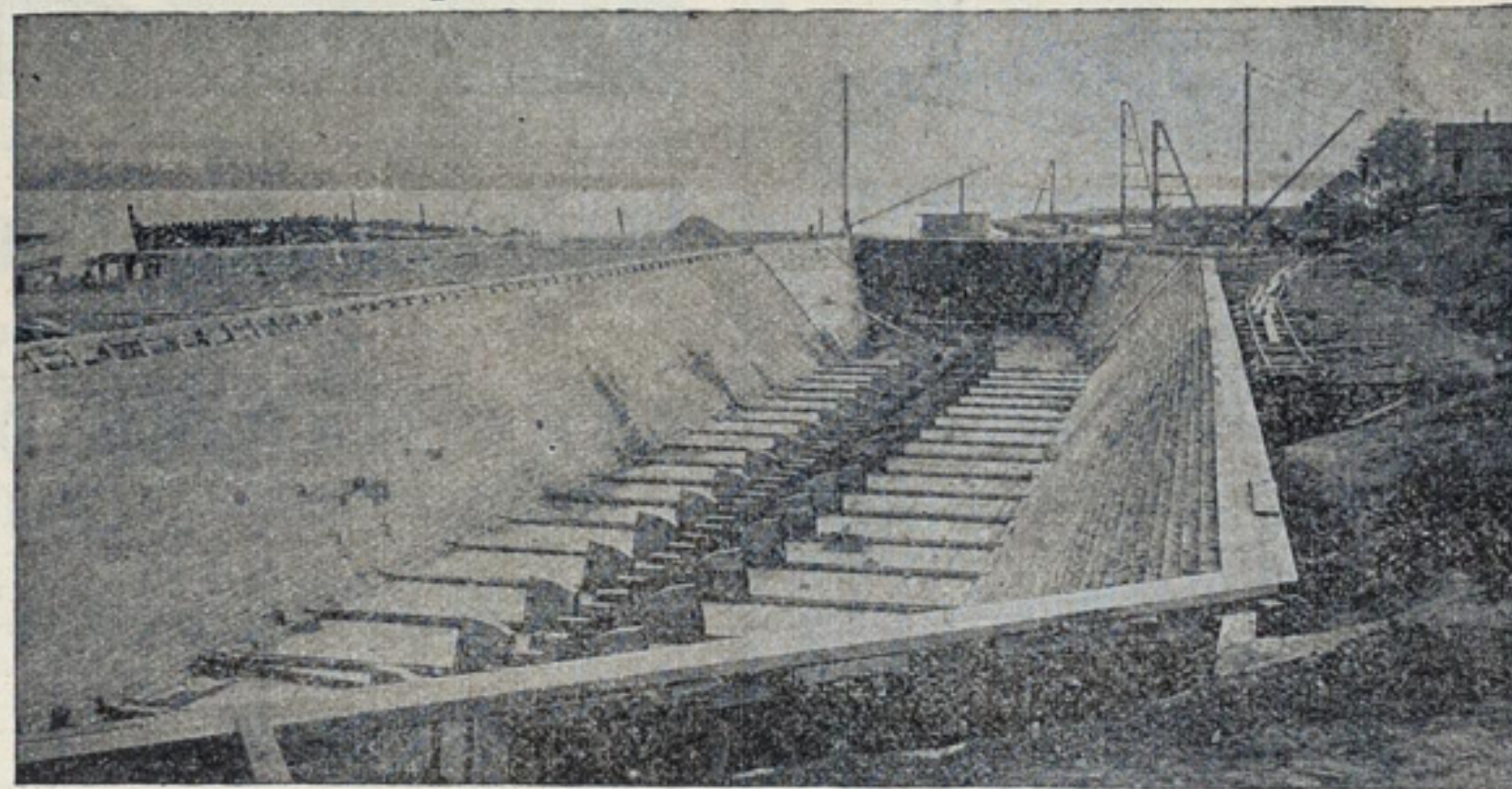


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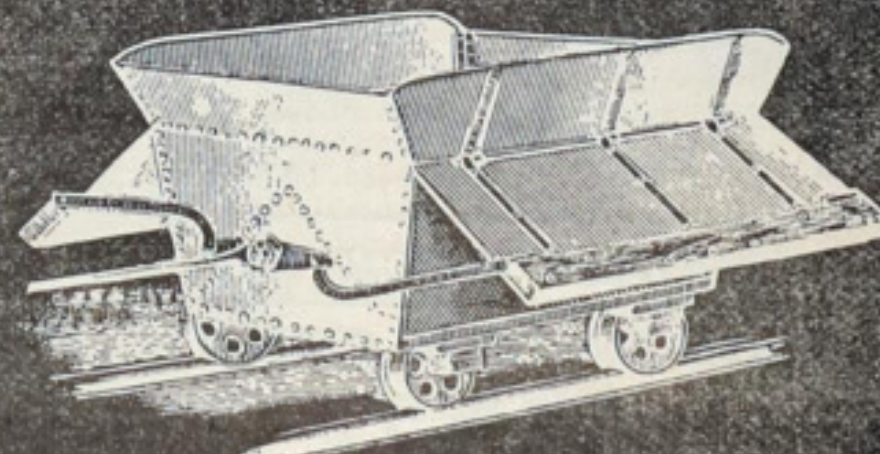
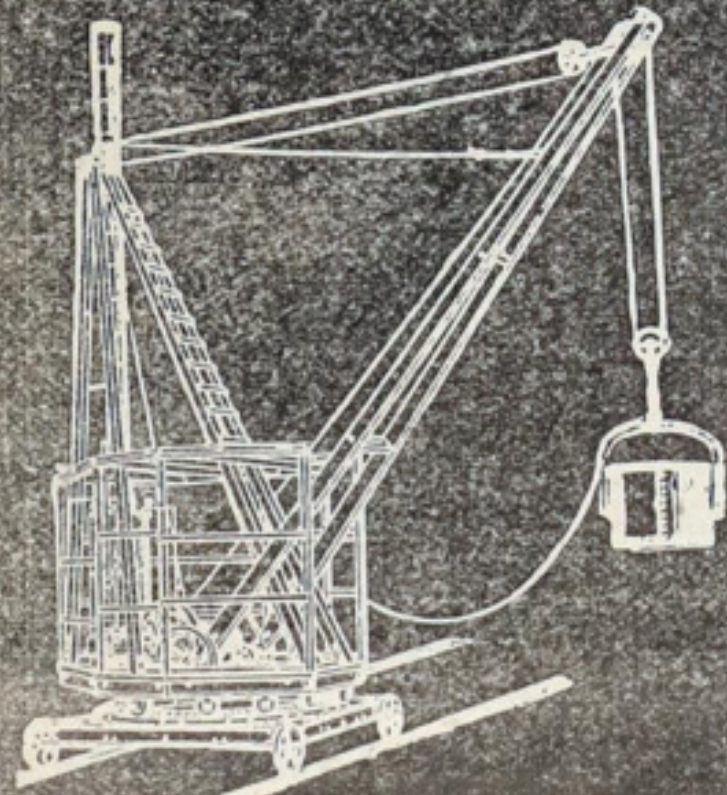
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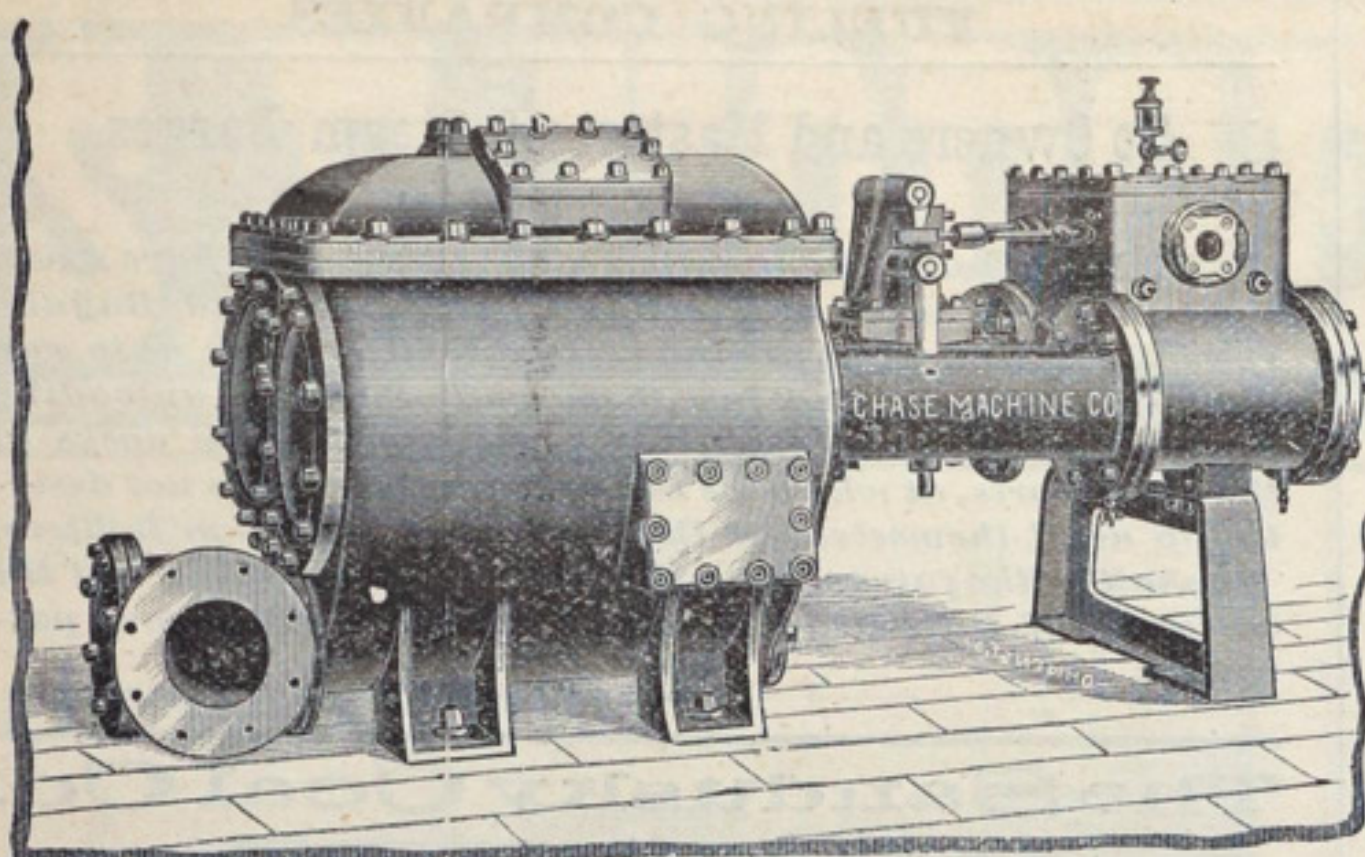
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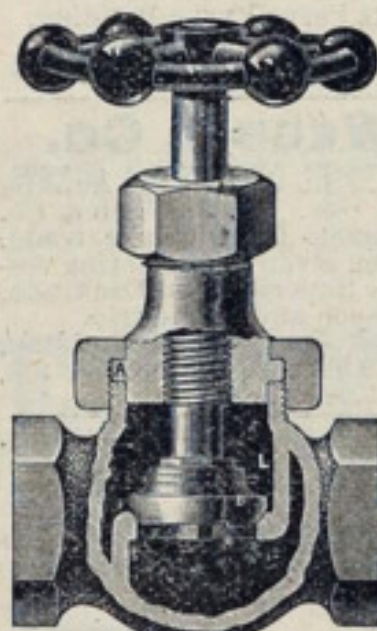
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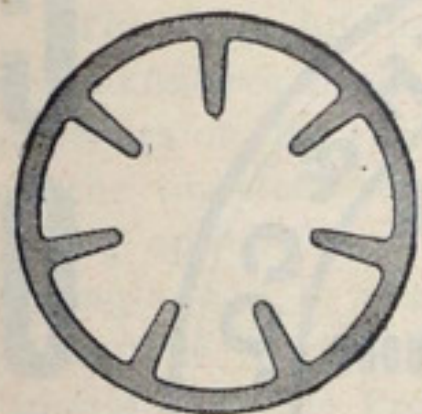
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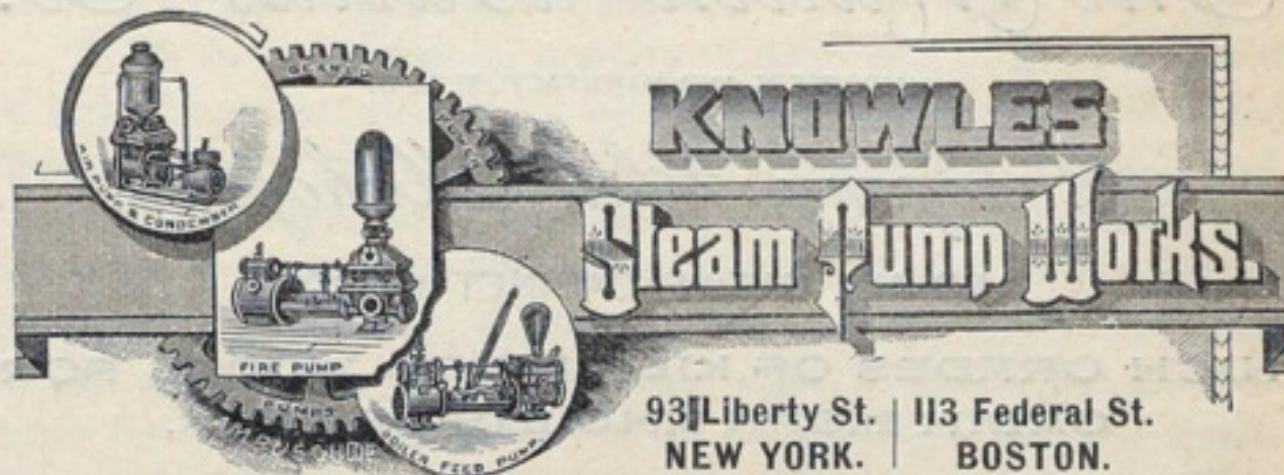
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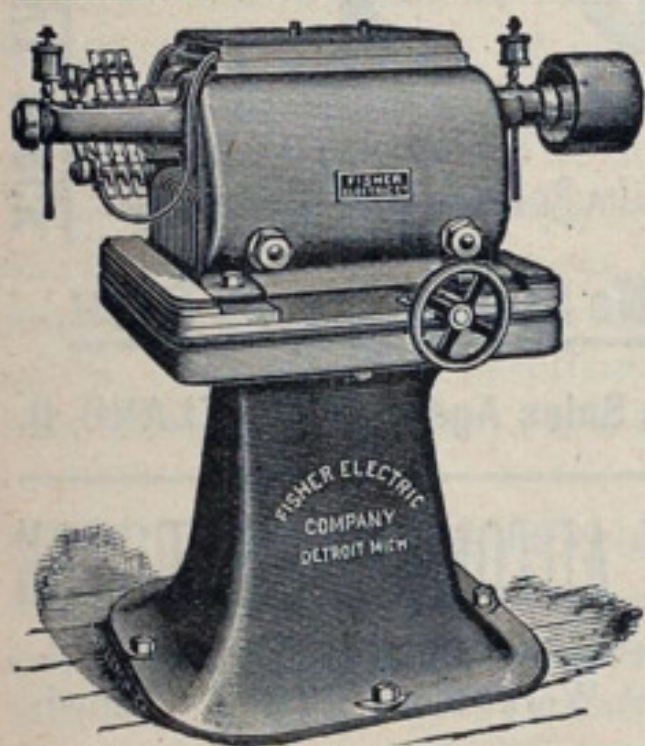
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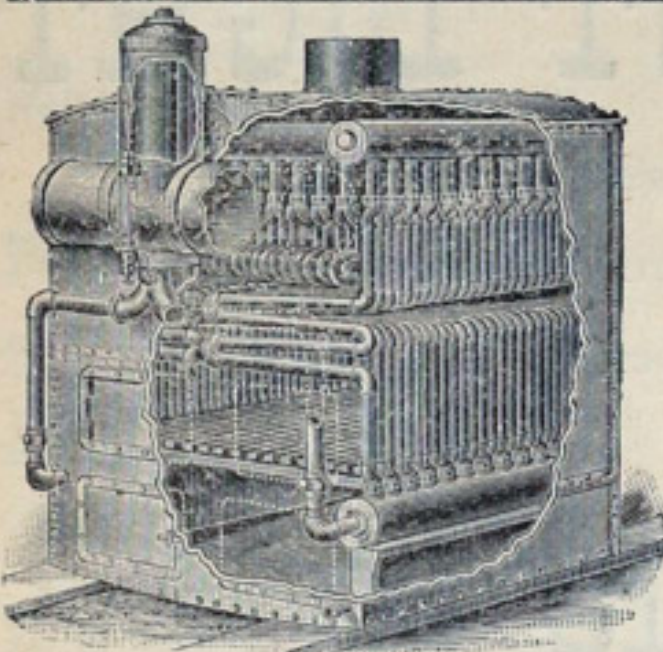
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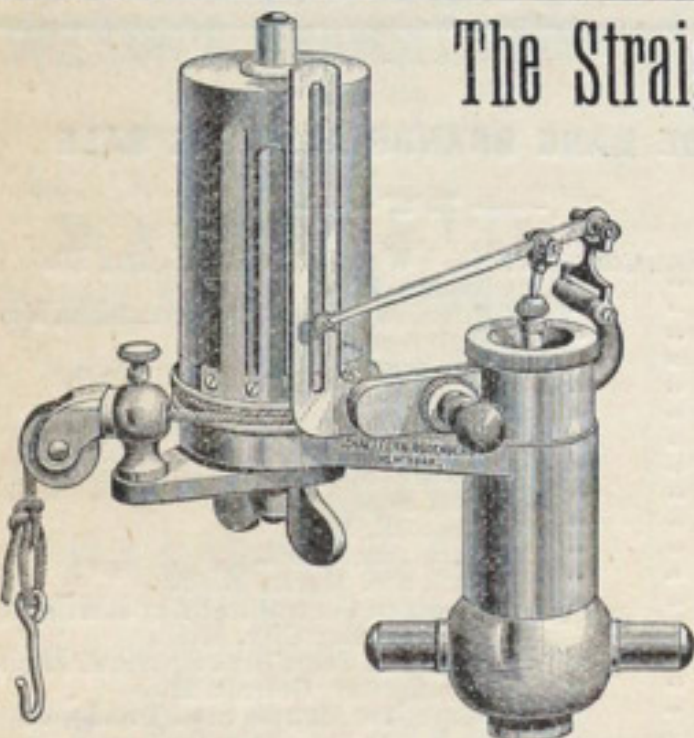
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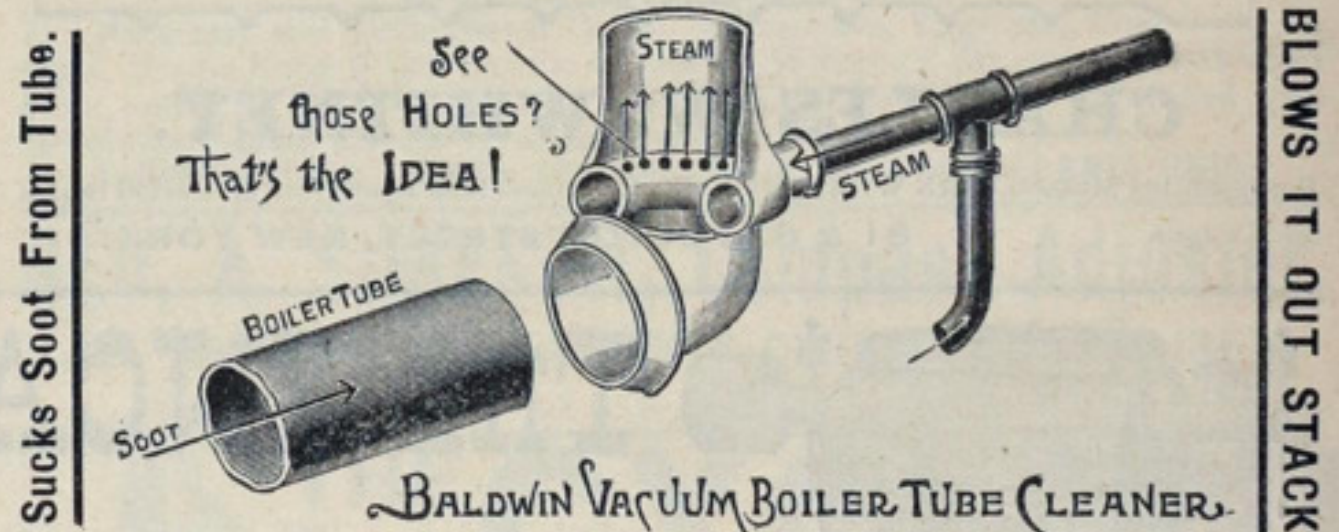
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